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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LEFFERS JR, GERALD G	

ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/836,602	ZANDER, AXEL R.	
	Examiner	Art Unit	
	Gerald G Leffers Jr., PhD	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 35-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6* is/are allowed.

6)☒ Claim(s) *1-5,7-11 and 35-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of a supplemental response, filed 12/23/2003 in response to a Notice of Nonresponsive Amendment. As of the response filed 12/23/2003, claims 1-11 and 35-40 are pending in the instant application.

Any rejection of record in the previous office action not addressed herein is withdrawn. This action is FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 7-11, 35-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **This rejection is maintained for reasons of record in the previous office action and repeated below. The rejection is extended to new claims 35-40.**

Each of the claims is drawn towards a gene transfer vector comprising a transgene and a nucleic acid sequence encoding a CD34 surface marker or fragment or variant of the same. Each of the claims comprises the functional limitation that the fragment or "variant" of a CD34 surface marker is identifiable by a CD34 detection method. The CD34 protein can be from any

source, or can be described by SEQ ID NOS: 1-6. The CD34 protein or variant is "expressible as a surface marker and is identifiable by an antibody against CD34".

The definition provided by the specification for a "variant" of CD34 reads on essentially any protein that shares at least some common structural or functional characteristic of CD34 (e.g. page 4, lines 20-24). Thus, the rejected claims read on an extraordinarily large genus of polypeptides (i.e. mutants or variants) that must be detectable in some fashion by a CD34-specific antibody.

The instant specification describes three embodiments for CD34 which are expressible as surface markers for eukaryotic cells and which are detectable by CD34 detection methods (e.g. Figure 1). The specification does not, however, teach a basis for one of skill in the art to envision modifications of the CD34 polypeptide which will remain detectable by a given CD34 detection method. Nor does the prior art appear to teach in what ways one can alter a given CD34 polypeptide and still have it remain detectable by a given CD34 detection method.

Given the broad genus of polypeptides encompassed by the rejected claims, and given the unpredictability of envisioning alterations to a given CD34 polypeptides such that it will remain detectable by a given CD34 detection method, one of skill in the art would not have been able to envision a sufficient number of specific embodiments of the claimed invention to describe the broadly claimed genus. Therefore, one of skill in the art would have reasonably concluded applicant was not in possession of the claimed invention.

Response to Arguments/112 1st Paragraph

Applicant's amendments and arguments filed 11/12/03, 12/08/03 and 12/23/03 have been fully considered but they are not persuasive. The responses essentially argue that the

amendments to the claims overcome the grounds for rejection made above with regard to description of CD34 variants and/or mutants. The responses further argue that the state of the art teaches that CD34 is well characterized and the skilled artisan would necessarily be able to envision a sufficient number of specific embodiments to described the claimed invention.

First, it is noted that many of the claims are generically drawn to a CD34 protein without reference to a particular sequence (e.g. human CD34). Thus, these broader claims read on any CD34 protein obtained from literally any source expressing a homologue of CD34 (e.g. *any* mammalian source). Further, the terms "mutant" and "variant" remain undefined and encompass literally any protein that may function in an analogous manner to CD34. The amendment of the claims to include the limitation that the CD34 protein or variant thereof is identifiable by an antibody against CD34 actually exacerbates the written description requirement to the extent that it specifies that the particular CD34 variant is expressible from that particular construct as a surface marker that is recognizable by an antibody against CD34. These additional functional limitations require more guidance from the prior art as to the structural/functional characteristics of those particular embodiments that will necessarily fulfill the functional limitations of the claim.

Applicant's submission concerning information available on the Internet regarding CD34 structural/functional characteristics has been considered but is not persuasive on several grounds. First, it is unclear which of the cited references were known and available in the art at the time of filing. Second, there is no specific guidance from applicant's response as to how the cited teachings provide a structural/functional framework for envisioning those particular variants that necessarily meet the functional limitations of the claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 35-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 35 recites the phrase "...said amino acid sequence being expressed as a surface marker." This phrase implies a method step for a claim directed to a gene transfer vector, making it unclear as to what is actually claimed. **This is a new rejection.**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The rejected claims are directed to a gene transfer vector which contains (i) a transgene, and (ii) a nucleic acid encoding a CD34 surface marker, or a fragment or variant of the same, wherein the surface marker or fragment or variant is detectable by a CD34-specific antibody. It is noted that the conditions under which the antibody-CD34 interaction is detected are not specified in the rejected claims (e.g. a western blot of an SDS-PAGE gel). The CD34 surface marker can comprise SEQ ID NO: 2, 4 or 6, or a fragment or variant thereof. The CD34 surface

marker can be encoded by SEQ ID NO: 1, 3 or 5, or by a fragment, mutant or variant of SEQ ID NO: 1, 3 or 5. The term "therapeutic gene" encompasses any gene encoding a protein whose presence confers survival of the host cell comprising the gene under any specific set of conditions (e.g. a selectable drug resistance marker). The specification does not expressly define the term "gene transfer vector". Thus, a reasonably broad interpretation of the term encompasses any vector that can be transferred to a heterologous host cell. The term "variant" is so broadly defined in the instant specification (e.g. page 4, lines 20-24) as to read on any protein that shares some structural or functional characteristic of CD34 (e.g. being a cell surface protein).

Claims 1-3, 7-10, 35, 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Hawley et al (U.S. Patent No. 5,962,644; applicant's citation in Paper No. 4; see the entire patent). **This rejection is maintained for reasons of record in the previous office action and repeated below. The rejection is extended to new claims 35, 38 and 39.**

Hawley et al teach the cloning and expression of the cDNA sequence encoding the porcine CD34 protein (e.g. Figure 1; columns 7 to 8, bridging paragraphs; Examples 2-3). Hawley et al teach that human CHO cells can be used for expression of the CD34 proteins of their invention (e.g. Example 3). Hawley et al teach that their expression constructs can comprise various selectable markers such as neomycin resistance (e.g. columns 7-8, bridging paragraphs).

Claims 1-3, 7-10, 35, 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Simmons et al (Journal of Immunology, 1992, Vol. 148, No. 1, pages 267-271; applicants

citation in Paper No. 9; see the entire reference). **This rejection is maintained for reasons of record in the previous office action and repeated below. The rejection is extended to new claims 35, 38 and 39.**

Simmons et al teach the cloning of a cDNA encoding human CD34 and expression of the cDNA in human COS cells (e.g. the Abstract). It is noted that Simmons et al do not teach that their expression vectors necessarily comprise an antibiotic selection marker (i.e. a "therapeutic gene"). However, Simmons et al do teach their constructs were amplified in bacteria and it is extremely unlikely that transformants comprising the constructs were not grown in media comprising an antibiotic for the selection of cells comprising the specific constructs. Therefore, the presence of a selectable marker on the constructs taught by Simmons et al would necessarily an inherent property of their constructs.

Because the Office does not have the facilities for examining and comparing the applicant's product with the products of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed products and the products of the prior art (e.g. that the products of the prior art do not possess the same material structural and functional characteristics of the claimed product). See in re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

Response to Arguments

Applicant's amendments and arguments filed 11/12/03, 12/08/03 and 12/23/03 have been fully considered but they are not persuasive. The responses appear to argue that the amendment to the claims to include language concerning the presence of a "therapeutic or suicide gene" overcome the rejection. This argument is not persuasive in that any antibiotic resistance marker

present on the expression constructs of the prior art would necessarily satisfy the requirements of the term "therapeutic gene".

Conclusion

Claims 1-5, 7-11, 35-40. Claim 6 is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerald G Leffers Jr., PhD whose telephone number is (571) 272-0772. The examiner can normally be reached on 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel can be reached on (571) 272-0781. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gerald G Leffers Jr., PhD
Primary Examiner
Art Unit 1636

GERRY LEFFERS
PRIMARY EXAMINER